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FOREST RESEARCH NEWS

FOR THE MIDSOUTH

September 1971

SOUTHERN FOREST EXPERIMENT STATION, FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Southern Pulpwood Production Climbs

Pulpwood production in the 12 Southern States climbed to 42,152,410 cords in 1970, exceeding last year's record by 3 percent.

This finding is reported in "Southern Pulpwood Production, 1970," a report by Roy C. Beltz, USDA Forest Service. The report is published jointly by the Southern and Southeastern Forest Experiment Stations at New Orleans, Louisiana, and Asheville, North Carolina. The Southeastern and Southwestern Divisions of the American Pulpwood Association cooperated in gathering the data.

The total production was made up of 25.8 million cords of softwood bolts, 7.7 million cords of hardwood bolts, and 8.6 million cords of chips and other residues salvaged as byproducts from wood-using plants.

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Building Better Beams

Among the softwood timbers of the world, the southern pines are preeminent for their uses in construction. Without being unduly heavy, they have both the strength to support great loads and the stiffness to resist excessive bending.

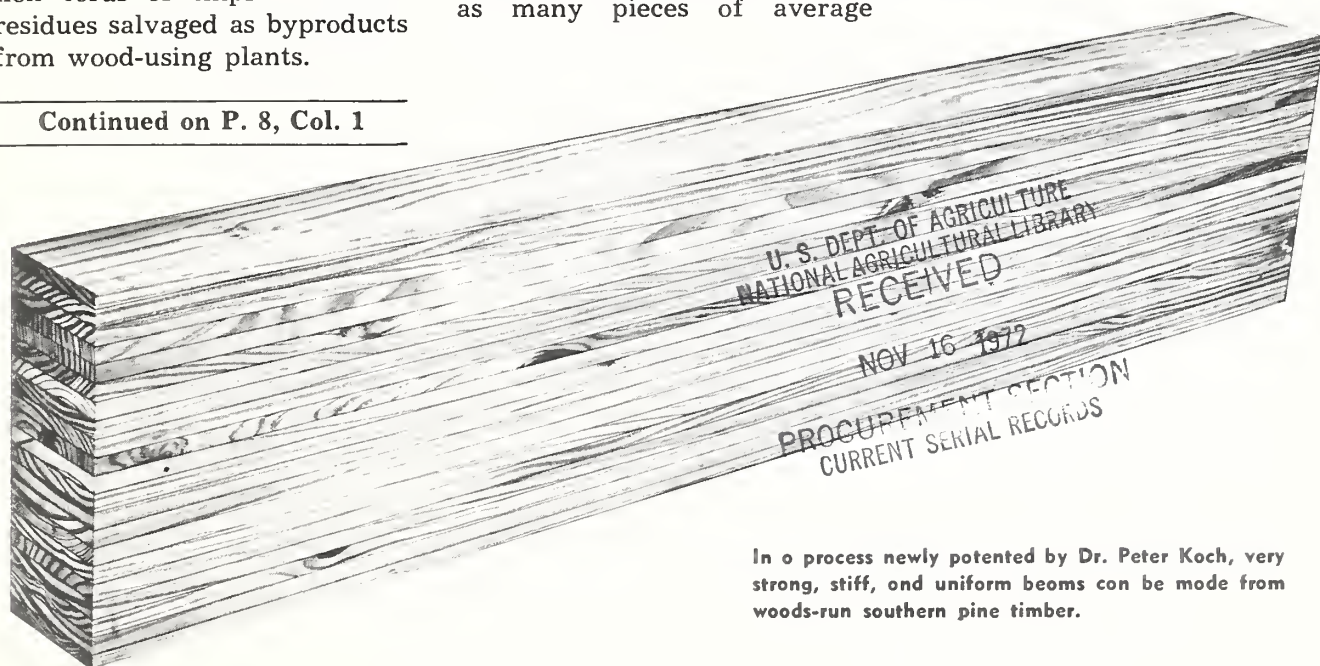
Now a scientist of the Southern Forest Experiment Station has found a way of making a good thing better. Peter Koch, of the Timber Utilization Laboratory at Alexandria, Louisiana, has just received a patent on a method for laminating exceptionally strong beams from run-of-the-woods timber.

As Koch explains, any random sample of southern pine lumber will contain some weak and some strong pieces, as well as many pieces of average

strength. Typically the strongest will be about five times stiffer and stronger than the weakest. Manufacturers therefore visually sort their supply of boards and sell the weakest ones for nonstructural use.

In a beam, the upper and lower portions of the cross section are stressed much more heavily than the middle. Koch conceived of the idea of assembling laminated beams from log-run boards by evaluating the stiffness of each board, putting the most limber boards in the center and the progressively stiffer boards on the outside.

When he glued up experimental beams on this principle he



In a process newly patented by Dr. Peter Koch, very strong, stiff, and uniform beams can be made from woods-run southern pine timber.

found they had strength and stiffness to justify working stresses about one-third greater than beams of high-grade lumber assembled in the conventional manner. Their deflection under load was about one-third less.

The beams also proved to be very uniform in strength and stiffness. Since structures must be designed so that the weakest members do not fail, variability in beams means that the strongest ones are frequently loaded far below capacity. Because of their uniformity, Koch's beams can be assigned substantially greater design loads than present day beams.

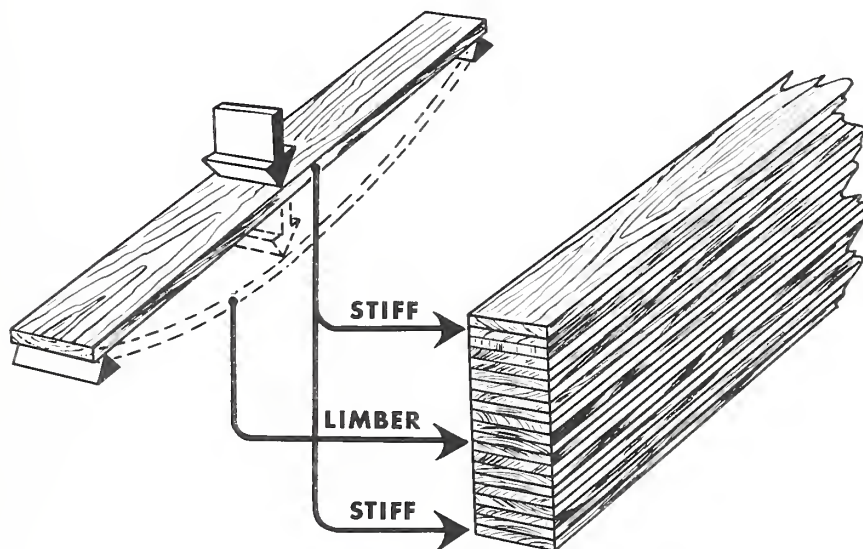
In industrial practice, it is likely that individual laminae would be automatically graded for stiffness and strength. By proper selection of laminae, the manufacturer would then be able to produce very stiff beams for applications where span length is governed by the amount of allowable deflection.

Similarly, he could make very strong members for purposes where strength requirements govern the design.

The new assembly principle also offers ways to save wood. To support a given load, beams made by Koch's method require fewer pounds of wood than do ordinary laminated beams. And all the wood from every tree can be used, not merely the best.

The patent, No. 3,580,760, is assigned to the United States of America so that it may be freely used by all laminators.

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Boards are graded for stiffness and then assembled with the most limber in the center and the stiffest on the outer portion of the beam.

Fungi May Be Cause of Blight

A needle blight on slash and loblolly pines in six Southern States during the past winter is now thought to have been caused by fungi. The trees at present appear to have recovered, but Forest Service scientists are trying to find out why the trouble started and what to do if it comes back.

The blight was called to the attention of the scientists in December when it was discovered in Hancock County, Mississippi. It was soon noted eastward to Florida and westward to Texas. Needles first turned brown from the center to the tips, and later died completely and fell from the trees. No known disease or insect could be detected at the time, according to Dr. Glenn A. Snow, in charge of southern pine disease research at the Southern Forest Experiment Station's laboratory at Gulfport.

Diseased needles collected in December showed no external signs of fungus fruiting bodies, Snow said, and no pathogens could be cultured from them. However, in February and March two fungi showed up with increasing frequency. Other related fungi have since been identified.

The blight is thought to be caused by the fungi *Lophodermella cerina*, *Ploioderma lethale*, and *Ploioderma hedgcockii*. Two of these fungi have been seen in southern pines for many years, but this is the first report of *L. cerina* on loblolly and slash pines and the first report

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Protecting Endangered Species

Public concern is growing for the threat of extinction facing some species of birds, animals, and wildflowers.

National Forests have always been a haven for wildlife and flowering plants. But some birds, animals, and wildflowers which once were plentiful now are scarce. Some are gone forever.

The USDA Forest Service, working with State Game and Fish Commissions and the U. S. Bureau of Sport Fisheries and Wildlife, aims to do all possible to provide a habitat where wildlife populations and wildflowers flourish.

Toward this end the Southern Region of the Forest Service has three booklets available to the public. One is "Endangered Rare and Uncommon Wildflowers Found on the Southern National Forests." Another is "Protecting Endangered Wildlife on your Southern National Forests." They contain full-color photographs and short descriptions of a number of the rare and endangered species. The third booklet, "New Forests for Wildlife," tells how Forest Service land management policies benefit sportsmen.

Thirty-five years ago, most of the South's old-growth forests were gone. Some game species, especially deer and turkey, were at a low ebb. Then local sportsmens groups, State Game Commissions, and the Forest Service began working together to restore forest lands in the South which had been abused in the past. Gradually, deer were brought back, and bear, turkey, squirrels, and raccoons all responded to improved land management policies.

Southern forests also provide a haven for an estimated 5,000 species of flowering plants, many of them found only in the South. Some of the rare and uncommon species are endangered because of what man is doing to their habitats. The Spider-lily and Purple Trumpet are among these. Others, like the Turk's-cap Lily, are picked frequently, endangering the species. No native wildflowers, and especially the less common ones, should be picked, according to the booklet. "The beauty that is taken today is one that will be missed tomorrow."

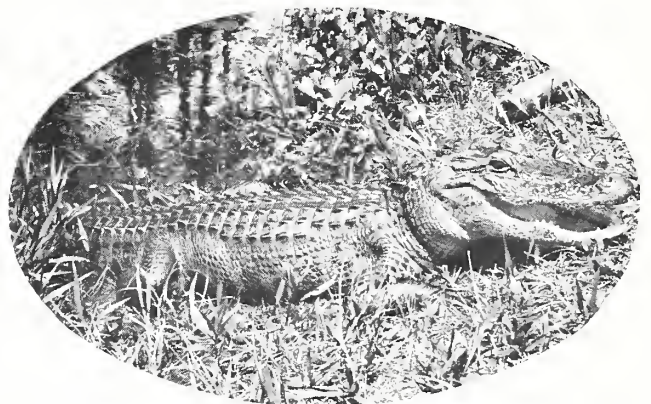
Man's thoughtlessness is also endangering some species of wildlife. The alligator, once considered plentiful, now faces extermination by poachers



Southern bald eagle, regarded since ancient times as a symbol of might and courage, now is endangered because of disturbances and loss of habitat.

who kill for the hide alone. The red wolf and the bald eagle have been killed because they were considered animals and birds of prey. The brown pelican, red-cockaded woodpecker, and the Bachman's warbler are threatened because of man's manipulation of their environment.

Post cards are provided in two of the booklets for readers who see some of the species described to send additional information alerting foresters.



Poaching by hunters seeking commercial hides and loss of habitat by drainage or impoundment of swamps and lowlands endangers survival of the American alligator.

NEW HANDBOOK TELLS ALL

Everything you always wanted to know about direct seeding southern pine trees can be found in a new handbook by two experts in the business, Harold J. Derr and William F. Mann, Jr.

The authors are USDA Forest Service scientists at the Southern Forest Experiment Station's laboratory at Alexandria, Louisiana. The publication is *Direct-Seeding Pines in the South*, Agriculture Handbook 391.

More than 20 years of problem-solving are summarized in 68 readable pages, and the authors have backed their text with ample photographic evidence that direct seeding works.

For at least a century foresters the world over have tried to restore forest land by what seemed an obvious method—sowing seeds at the right time of year directly in the forest. But failures outnumbered successes, and foresters had to rely on planting nursery-grown seedlings.

To make direct seeding work, the Southern Station scientists had to find a way to discourage birds and rodents from devouring most of the seeds. A major breakthrough was an effective, nontoxic seed coating to repel predators. In the first field tests seeds coated with the preparation and sown at the rate of about 12,000 per acre produced 4,500 seedlings in contrast to 195 for uncoated seeds.

Ways to speed germination also helped, by reducing the time seeds are exposed to predators and the weather. And the scientists figured out the best methods of preparing seedbeds and the best seasons for sowing various species. Their experience has been mostly with longleaf, loblolly, and slash pine, but the handbook also contains information about shortleaf, Virginia, and white pine.

Direct seeding offers a number of advantages as a reforestation technique, and more than one and a half million southern

acres have been sown in the last 15 years. On many sites it cuts costs by 50 to 75 percent. It is adaptable on both large and small ownerships, and is the answer where terrain is rough or other conditions make accessibility difficult.

For instance, when forests are destroyed by fire and windstorms, stumps and debris make it very difficult for planting crews to work. By contrast, direct seeding from airplanes or helicopters is quick and successful—180 to 300 acres can be seeded per hour.

In Alabama the spoil banks left after strip mining—steep, rocky, and almost impossible to plant—have been successfully reforested. So have areas where high water most of the year impedes planting. Acres of low-value hardwoods and unproductive brushlands have been converted to pine in large-scale seeding operations. Vast grasslands, where stumps jutting through the heavy sod are the only reminders of virgin forests that once covered the land, have been economically restored to productivity. Derr and Mann have seeded all these sites, and their experiences, published and heretofore unpublished, can be found in the new handbook.

Copies are available from the Southern Forest Experiment Station headquarters, 701 Loyola Avenue, New Orleans, Louisiana 70113.



The average American uses more than a ton of wood each year in the form of paper, lumber, and other wood-based products.

Longleaf pines seeded from the air starting height growth on an open, well-drained site. More than one and a half million southern acres have been direct seeded in pine during the last 15 years.



Superior Service Awards Given For Work At Southern Station

Raymond G. Bell, an assistant director at the Southern Forest Experiment Station, New Orleans, and Dr. Brian R. Payne, former Southern Station re-



R. G. Bell



Dr. Brian R. Payne

Pine seedlings need release from overtopping hardwoods to grow rapidly. One-year-old loblolly seedlings on the right were released in June. Smaller ones were not released.

searcher at Tuskegee, Alabama, have received USDA Superior Service Awards. Payne is now stationed at Amherst, Mass., on the staff of the Northeastern Forest Experiment Station.

Bell's award cited his work in "developing and implementing an outstanding administrative and technical support organization." Payne's award was for "distinctive achievement in formulating and implementing a program in education and research at Tuskegee Institute to develop forestry career opportunities for black students."

Bell began working for the Forest Service in 1933 in Florida, and handled a variety of assignments in all three branches of the Forest Service before being named to his present position in 1967.

Payne first worked at the Pacific Northwest Forest and Range Experiment Station in Portland, Oregon, in 1962, transferring to Tuskegee in 1968. In June 1970 Tuskegee Institute awarded him a Certificate of Appreciation for outstanding contributions.

50th Anniversary Commemorated

All of the directors of the Southern Forest Experiment Station during its 50-year history gathered in New Orleans for a golden anniversary celebration on July 23. They are, left to right standing: C. A. Connoughton, director 1944-51, recently retired as Regional Forester of the Pacific Northwest Region, Portland, Oregon, now serving as President of the American Forestry Association; R. L. Youngs, present Southern Station Director; W. M. Zillgitt, director 1963-66, recently retired as Director of the Southeastern Forest Experiment Station, Asheville, North Carolina; T. C. Nelson, director 1966-70, newly-named Deputy Chief of the USDA Forest Service in charge of programs and legislation, Washington, D. C., previously associate deputy chief of State and Private Forestry; P. A. Briegleb, director 1954-63, recently retired as director of the Pacific Northwest Forest and Range Experiment Station, Portland, Oregon; Left to right seated: E. L. Demmon, director 1927-44, retired, living at Asheville, North Carolina; H. L. Mitchell, director 1951-53, now in charge of wood quality research at the Forest Products Laboratory, Madison, Wisconsin; R. D. Forbes, the first director, serving from 1921-27, retired and living in Wilmington, Delaware.





Arkansas Forest Resources Analyzed

Forest acreage in Arkansas declined by one-eighth in the decade from 1959 to 1969. But despite loss of acreage, total timber volume increased. Softwood growing stock volume climbed 16 percent. Hardwood fell 7 percent.

These are some of the facts in a new report released by the Southern Forest Experiment Station of USDA's Forest Service. Author of the report is Charles C. Van Sickle of the Southern Station's Forest Resources Research unit.

Clearing for cropland in the Delta and for pasture in the Ozarks made the biggest encroachments on forests, claiming more than 2 million acres. Another half million acres were yielded to urban and other uses.

Clearing was heaviest in bottom-land hardwood stands of the Mississippi Delta. It reached a peak in the mid-1960's as soy beans were planted on more and more acres. Largely as a result of this widespread clearing in the Delta region, more hardwood timber was burned or otherwise disposed of than was used for products during the 10-year span.

The report states that the rate of land clearing has now slowed considerably. In 1968, hardwood growth exceeded removals for probably the first time in several years. The hardwood inventory at present appears to be increasing by 1 percent annually, and softwoods are gaining more than 1.5 percent. For the State as a whole, volumes of

"Fire Weather" For Fire Fighters

A new handbook for wildfire fighters provides 229 pages of color-illustrated scientific information on the relationship between weather phenomena and wildfire incidence and behavior.

Titled "Fire Weather," the handbook was issued jointly by the USDA Forest Service and the U. S. Department of Commerce Weather Bureau.

Secretary of Agriculture Clifford M. Hardin calls the handbook a "landmark guide to fire weather behavior knowledge and how that knowledge may be applied to forest fire control operations."

U. S. expenditures for controlling forest fires average about \$316 million a year. In an average year, forest fires start

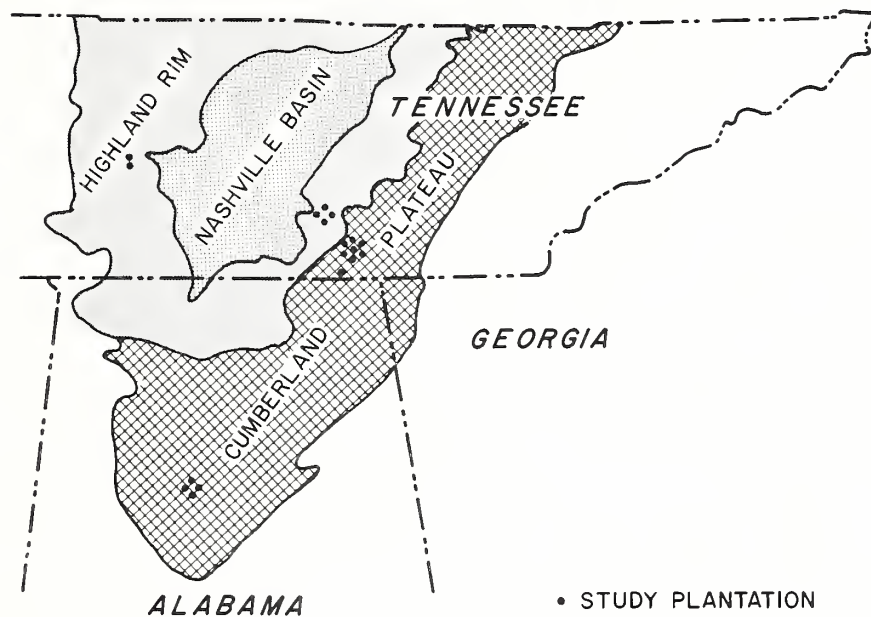
in 125,000 places, burn 5 million acres, consume 113 million tons of wood, send up 165 cubic miles of smoke, emit 364,000 tons of smog-producing hydrocarbons, burn 25 Americans to death, and injure 1,350 more.

Information in the new handbook will assist forest protection organizations in distributing men and equipment for fire-fighting readiness. It will aid the fire control officer in instigating preventive measures and attacking conflagrations while they are still small, thus minimizing fire-fighting costs.

Copies of "Fire Weather" are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

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Planting Yellow-Poplar Can Be Successful If-



• STUDY PLANTATION

Physiographic provinces of central Tennessee and northern Alabama.

If competing vegetation is controlled, yellow-poplar trees will grow well when planted in central Tennessee and northern Alabama.

Ten years of studies are described in a booklet titled "Planting Yellow-Poplar in Central Tennessee and Northern Alabama." Authors are T. E. Russell, N. S. Loftus, A. L. Mignery, and G. W. Smalley, all researchers at the Southern Forest Experiment Station's Silviculture Laboratory at Sewanee, Tennessee.

The booklet describes early performance of yellow-poplar in 18 plantations on the Cumberland Plateau and the Highland Rim. These two provinces contain nearly 11 million acres of commercial forest land.

Before the trees are planted, any overtopping hardwoods should be removed. Understory brush should also be controlled, if it is dense. Survival in the test plantations was good, and the trees generally grew fast enough to overtop competing vegetation that developed after the initial control operation.

Since none of the plantations are more than 10 years old, it is too early to draw conclusions about choice of sites. Coves and deep hollows are probably the best, but it seems likely that yellow-poplar will thrive on a wider range of sites than was first thought. Narrow, dry ridges or shallow soils should be avoided.

For details, write for Forest Service Research Paper SO-63, Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.



Eight growing seasons after planting, dominant trees on a good cove site are 4 to 6 inches in diameter and over 35 feet high.

Pulpwood, Cont'd from P. 1

North Carolina had the largest increase in 1970—about 590,000 cords. Louisiana's output rose about 32,000 cords, and South Carolina's about 190,000 cords. Output did not rise in any of the three States where production is greatest. Georgia is still the leader, but 1970 output was less than 1969. Alabama was second with production remaining the same, and Mississippi was third with a slight decline.

Pines and other softwoods comprised slightly over three-fourths of the total roundwood production. Of the hardwood roundwood, 40 percent was oak, 31 percent gums, and 29 percent other species. Use of gums is declining, while volume of oaks and other hardwoods increases.

Seventy-one counties produced at least 100,000 cords of roundwood in 1970. Alabama alone had 18 such counties. The three leading producers were Choctaw County in Alabama, Beaufort in North Carolina, and Fairfield in South Carolina. Choctaw and Fairfield have been among the top producers in past years, but Beaufort is a newcomer to the group.

Southern pulping capacity rose 3 percent as two new mills started up and construction was begun on another. A total of 107 mills in the South, plus 12 in nearby States, are now processing southern pulpwood.

Gains in 1970 were less than in other recent years. They averaged 3.1 percent, as contrasted to an average annual rate of 6 percent during the past decade. The small gains made in 1970 probably reflect slow

growth in the national economy, Forest Service researchers said.

Copies of the new publication, Resource Bulletin SO-28, are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113, and from the Southeastern Forest Experiment Station, P. O. Box 2570, Asheville, North Carolina 28802.

Arkansas, Cont'd from P. 6

growing stock total more than 6 billion cubic feet of softwoods and almost 9 billion cubic feet of hardwoods. Only about 10 percent of the forest land in Arkansas can be considered seriously understocked. Stands of smaller trees are more prevalent in both softwoods and hardwoods than they were a decade ago.

There are many opportunities for improvement. Oak-pine and oak-hickory types occupy 8 million acres of land better suited to growing pines than hardwoods. Conversion to pure pine would increase productivity of these areas. Upgrading the quality of timber in adequately stocked stands would also be helpful. Trees suited to the sites where they are found and of good form and quality now stock only one-fourth of the forest acreage.

Assistance from public and private organizations made it possible to keep the field work for the new inventory ahead of the schedule that could have been maintained with regularly allotted funds, the report said. The cooperating organizations were Arkansas State Forestry

Commission; Arkansas Kraft Company; Deltic Farm & Timber Company, Inc.; Dierks Forests, Inc.; Georgia-Pacific Corporation; International Paper Company; Nekoosa-Edwards Paper Company; Olinkraft, Inc.; and Potlatch Forests, Inc.

Copies of "Arkansas Forest Resource Patterns" are available on request from the Southern Forest Experiment Station, T-10210 Federal Building, 701 Loyola Avenue, New Orleans, Louisiana 70113.

Fungi, Cont'd from P. 2

of the fungi in Louisiana, Mississippi, and Alabama. The two commonly observed fungi normally have little effect on southern pines.

Among possible causes considered were atmospheric pollution, a severe early freeze in November preceded and followed by periods of warm weather, and even the possibility that hurricanes had affected the soil or physiology of the pines. None of these theories has been proved or disproved. The disease did not spread from a single center of infection, but seemed to break out more or less simultaneously in many localities.

The new spring crop of needles looks good, Snow said. No trees are known to have died, but their growth probably was reduced. It is too early to tell if recovery is complete, and there is no way of knowing if the disease will reappear. The forest researchers are keeping watch on the trees and trying to learn why normally harmless fungi suddenly went on a rampage.